What is claimed:

1 1.   A method of operating an apparatus to scale soft input values obtained, from a signal
2 transmitted through a communications channel, as part of a decoding process, the method
3 comprising:
4   computing a current scaling factor as a function of a preselected channel quality value
5 and at least one of said soft values, said preselected channel quality value being independent of
6 actual channel conditions at the time said signal was transmitted; and
7   scaling one of said soft values using said computed current scaling factor to produce a
8 scaled soft value.

1 2.   The method of claim 1, wherein a plurality of soft value distributions are possible, a
2 subset of possible soft value distributions corresponding to said preselected channel quality
3 value while other possible distributions correspond to other channel quality values, said step of
4 computing a current scaling factor including:
5   determining a scaling factor which, when applied to said received soft values, produces a
6 soft value distribution in said subset of soft value distributions corresponding to said preselected
7 channel quality value.

1 3.   The method of claim 2, wherein determining a scaling factor includes:
2   computing from at least some of said soft input values a plurality of channel quality
3 values, each channel quality value corresponding to a different scale factor.

1 4.   The method of claim 3, further comprising:
2   interpolating between at least two of said plurality of channel quality values to produce
3 an interpolated value; and
4   determining said current scale factor as a function of the interpolated quality value.

1 5.   The method of claim 1, wherein said preselected channel quality value is a channel
2 capacity value.

1 6.   The method of claim 3, wherein computing said scaling factor includes;
2   determining a current channel quality function from a first scale factor.

1   7.   The method of claim 6, further comprising:

2   solving said function to determine a scale factor which, when applied to said function

3   given said at least some soft input values, produces said target channel quality, said determined

4   scale factor being used as said current scale factor.

1   8.   The method of claim 2, wherein determining the current scale factor is part of a iterative

2   process that includes:

3   updating the current scale factor as a function of a soft value scaled by the current scale

4   factor being updated.

1   9.   The method of claim 8, wherein said updating includes:

2   comparing a channel quality value corresponding to the scaled soft value to the target

3   quality value to determine a difference between the target quality value and the corresponding

4   quality value; and

5   adjusting the scaling factor as a function of said determined difference.

1   10.   The method of claim 9, wherein said scale factor is adjusted in a direction which reduces

2   subsequent differences between the channel quality value corresponding to a subsequently

3   processed soft value and said target channel quality value.

1   11.   The method of claim 9, wherein scale factor adjustments are made within a range

2   extending between a maximum permitted scaling value and a minimum permitted scaling value,

3   individual scale factor adjustments being no larger than a maximum adjustment step size of 2%

4   of the maximum permitted scaling value.

1   12.   The method of claim 1, wherein said preselected channel quality value is a value

2   corresponding to a quality region that is within but near the edge of an acceptable channel

3   quality region

1   13.   The method of claim 1, wherein said decoding process includes at least one of a low

2   density parity check decoding operation and a turbo code decoding operation.

1   14.   An apparatus for determining a factor to be used to scale soft input values obtained, from

2   a signal transmitted through a communications channel, comprising:

3   a receiver for receiving a signal transmitted through a communications channel;

4   means for generating soft input values from said received signal;

5   memory for storing a preselected channel quality value, said preselected channel quality

6   value being independent of actual channel conditions at the time said signal was transmitted; and

7   means for computing a scaling factor as a function of said preselected channel quality

8   value and at least one of soft input values.

1   15.   The apparatus of claim 14, wherein said preselected channel quality value is a value

2   corresponding to a quality region that is near the edge of an acceptable channel quality region.

1   16.   The apparatus of claim 15, wherein said preselected channel quality value is a channel

2   capacity value.

1   17.   The apparatus of claim 14, wherein a plurality of soft value distributions are possible, a

2   subset of possible soft value distributions corresponding to said preselected channel quality

3   value while other possible distributions correspond to other channel quality values, said means

4   for computing a scaling factor including:

5   means for determining a scaling factor which, when applied to said received soft values,

6   produces a soft value distribution in said subset of soft value distributions corresponding to said

7   preselected channel quality value.

1   18.   The apparatus of claim 17, wherein said means for determining a scaling factor includes:

2   means for computing from at least some of said soft input values a plurality of channel

3   quality values, each channel quality value corresponding to a different scale factor.

1   19.   The apparatus of claim 18, further comprising:

2   means for interpolating between at least two of said plurality of channel quality values to

3   produce an interpolated value; and

4   means for determining said scale factor as a function of the interpolated quality value.

1 20.   The apparatus of claim 19, wherein said means for computing and means for
2 interpolating each include computer instructions for controlling a processor to implement at least
3 a portion of said computing and interpolating operations.

1 21.   The apparatus of claim 18, wherein said means for computing said scaling factor
2 includes:
3   means for determining a channel quality function from a first scale factor; and
4   means for solving said function to determine a scale factor which, when applied to said
5 function given said at least some soft input values, produces said target channel quality, said
6 determined scale factor being used as said current scale factor.

1 22.   The apparatus of claim 17, wherein said means for determining the current scale factor
2 performs an interactive process, said apparatus further including:
3   a control loop for updating the current scale factor as a function of a soft value scaled by
4 the current scale factor being updated.

1 23.   The apparatus of claim 22, wherein said control loop includes:
2   a comparator for comparing a channel quality value corresponding to the scaled soft
3 value to the target quality value to determine a difference between the target quality value and
4 the corresponding quality value; and
5   means for adjusting the scaling factor as a function of said determined difference.

1 24.   A machine readable medium comprising;
2   machine executable instructions for controlling a machine to perform the steps of:
3   i) computing a current scaling factor as a function of a preselected channel
4   quality value and at least one soft input value obtained, from a signal transmitted
5   through a communications channel, said preselected channel quality value being
6   independent of actual channel conditions at the time said signal was transmitted;
7   and
8   ii) scaling said at least one said soft value using said computed current scaling
9   factor to produce a scaled soft value.

1   25.   The machine readable medium of claim 1, further comprising:

2   said preselected channel quality value, said preselected channel quality value being a

3   value corresponding to a quality region that is near the edge of an acceptable channel quality

4   region.

1   26.   The machine readable medium of claim 25, wherein said channel quality value is a

2   communications channel capacity value.